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ABSTRACT

Analysis of demographic data is utilized in this report to trace the relationship between public expenditure and school enrollment in Ontario and to predict the direction of educational expenditure in light of projected enrollment trends. The report shows that inflation, changes in educational policy, and increases in teacher salaries, rather than growth in enrollment, were the major contributory factors to expansion in elementary and secondary school expenditure in the 1960s and early 1970s. Thus, a further decline in school enrollment in the future may not necessarily bring a reduction in educational spending. The report predicts that, even discounting inflation, educational expenditures will continue to grow because of teachers' rising salaries, the continued need for capital spending, and a greater number of retired teachers receiving pensions. (Author/WD)

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WORKING PAPER NO. 38

THE EFFECT OF DEMOGRAPHIC CHANGE ON ELEMENTARY AND SECONDARY SCHOOL EXPENDITURE

A STAFF REPORT PREPARED BY THE
SOCIAL AND ECONOMIC DATA
CENTRAL STATISTICAL SERVICES
MINISTRY OF TREASURY, ECONOMICS & INTERGOVERNMENTAL AFFAIRS

AUGUST, 1978

EA 013 290

COMMISSION ON DECLINING SCHOOL ENROLMENTS IN ONTARIO (CODE)

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THE EFFECT OF DEMOGRAPHIC CHANGE ON ELEMENTARY AND SECONDARY SCHOOL EXPENDITURE

A Staff Report prepared by the
Social and Economic Data
Central Statistical Services
Ministry of Treasury, Economics & Intergovernmental Affairs

August, 1978

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DEC 19 1980

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Toronto, October 31, 1978

PREFACE

At the risk of some generalization, it is fair to say that there are hardly any major social and economic development issues where population does not enter into consideration. In turn, many issues are eventually reflected in expenditure patterns. To obtain a better understanding of how demographic trends -- size, composition and distribution -- affect certain aspects of provincial expenditure in Ontario, a study was initiated to identify some of the issues. Because of its importance, education was selected as one of the sectors for study.

In the course of the study, the Commission on Declining School Enrolments in Ontario (CODE), which was set up by the Ontario government in the summer of 1977, approached Central Statistical Services of this Ministry to expand some of the analytical work as support for some of the Commission's studies. This staff report was undertaken mainly in response to the Commission's request. Details on enrolment projections and the use of school facilities are contained in a separate study presented to the Commission earlier.

The study was prepared by Mr. C. Wong.

Social and Economic Data
Central Statistical Services
August, 1978

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SUMMARY

This report demonstrates that growth in enrolment was not the major contributory factor to the enormous expansion in the elementary and secondary school expenditure which took place in the past. The bulk of the expenditure increase can be accounted for by inflation and changes in education policy, such as, pupil/teacher ratios, and increases in teachers' salaries. During the 1965 - 1975 period, for example, these factors accounted for nearly 90% of the instruction salaries increase -- the largest education expenditure component.

The report concludes that, assuming no change in policy, a further decline in school enrolment in the future may not necessarily result in reduced education spending. In all probability, even discounting inflation, elementary and secondary school expenditure may well continue to rise in the next few years because of increased teachers' qualifications, and experience as well as continued need for capital spending in a number of locations. Expenditure associated with pensions is also expected to rise, a result of increased salaries and aging of the teaching labour force. Towards the end of the century, the proportion of teachers who have reached the qualified retirement age (that is, 55 and over) is expected to triple.

I) INTRODUCTION

The purpose of this report is twofold. First, it identifies the historical relationships between the pattern of public expenditure on the elementary and secondary school systems, and the enrolment trend, which, to a fairly large extent, is a result of changes in demographic characteristics (size and age composition of the population). Secondly, it provides a perspective on the direction of change in education expenditure in the light of projected enrolment trends to 2001.

II) CHANGES IN POPULATION, ENROLMENT AND EXPENDITURE: A HISTORICAL PERSPECTIVE

The emergence of the "baby boom" and the large influx of immigrants in the post-war period have produced a substantial change in the enrolment pattern in Ontario.* From less than 100,000 in 1946, the number of new births in the province increased to over 150,000 per year in the

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* For a more detailed description on the population and enrolment trends, see The Effect of Demographic Change on Enrolment and Use of School Facilities in Ontario to the Year 2001, a staff report prepared by the Ministry of Treasury, Economics and Intergovernmental Affairs for the Commission on Declining Enrolments in Ontario (CODE) April, 1978.

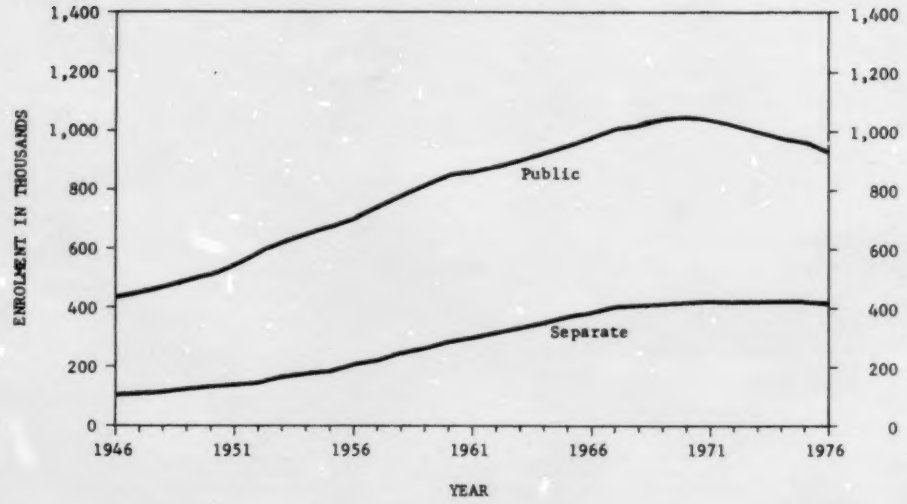
early 1960s. Added to this natural increase was the number of children (aged 0-17) that migrated to the province ranging from about 10,000 to over 40,000 per year. This population growth was reflected in elementary and secondary enrolment which more than tripled between 1946 and 1971 (Figure 1).

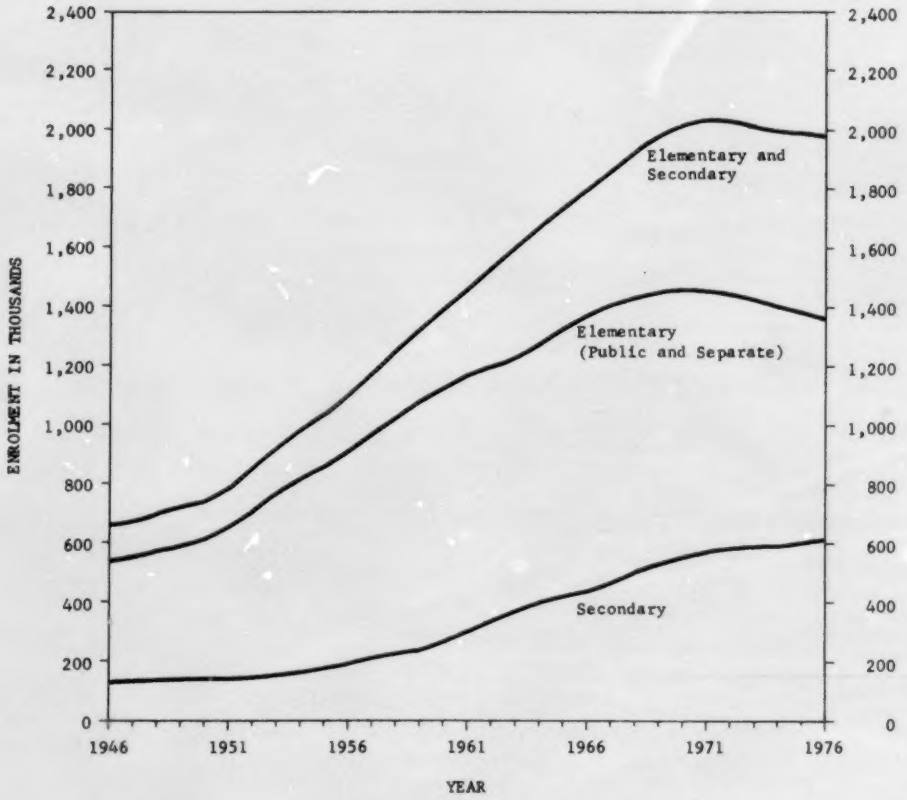
Changes in education policy and in social and economic conditions were also responsible for part of the enrolment increase. In the elementary school system, the extension of kindergarten and special education classes is a case in point. In regard to the secondary system, there were two aspects of the economy which had important implications for enrolment. Rapid economic expansion in the province, especially during the 1960s, and increasing technological complexity have resulted in a growing demand for a large, but also better educated and better trained labour force. School authorities responded to this need by extending their predominantly academic program to include vocational training, as well as by making the facilities more accessible. These factors, reinforced by a change in social attitudes toward higher education and the provision of expanded facilities, were the main causes for the increase in participation in the secondary school system during the 1950s and 1960s. As a result, the proportion of the population aged 15-19 enrolled in secondary schools in the province doubled, from about 40% in 1950 to 80% in the 1970s. Between

FIGURE 1

ENROLMENT TRENDS - PUBLIC, SEPARATE AND SECONDARY,

ONTARIO 1946 - 1976





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1951 and 1970, over 90% of the growth in elementary enrolment and about 40% of the growth in secondary enrolment were attributable to demographic changes while the remaining portion was accounted for by other factors (Table 1).

From 1971, the trend in the elementary school system began to reverse and enrolment began to decline, a result of the dramatic fall in the birth rate which started in the latter part of the 1960s, coupled with a loss of migrant children in the interprovincial migration exchange. Because of the time lag, it is expected that similar declines will take place in the secondary school system beginning in the late 1970s.

Against this background of the enrolment trends, substantial changes have also taken place in the education expenditure by the public sector. Between the mid-1950s and 1971, Ontario experienced an enormous growth of expenditure on education (Figures 2 and 3).* During this period, even after discounting inflation, education expenditure by the Province and by the school boards increased about threefold and fourfold respectively. The proportion of expenditure for education, as a per cent of total provincial expenditure increased from about 20% prior to the mid 1950s to about 30% in the 1960s. However, in the past few years, three major

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* Refers to expenditure on elementary and secondary education.

TABLE 1

ESTIMATE OF THE EFFECT OF DEMOGRAPHIC CHANGE ON ELEMENTARY AND SECONDARY SCHOOL ENROLMENT, ONTARIO, 1951 TO 1970

ELEMENTARY

COMPONENTS OF ENROLMENT GROWTH	NUMBER	PER CENT OF TOTAL
Due to extension of kindergarten and special education programs	55,200	7
Due to demographic change	755,800	93
Total enrolment growth	811,000	100

SECONDARY

COMPONENTS OF ENROLMENT GROWTH	NUMBER	PER CENT OF TOTAL
Due to increase in participation rate	264,000	62
Due to demographic changes	159,400	38
Total enrolment growth	423,400	100

NOTE: In elementary school the effect of kindergarten and special education was calculated by obtaining the difference between the actual change and the change which would have taken place if the per cent enrolment in kindergarten and special education to total elementary enrolment remained the same in the period considered. In 1950 the actual per cent of kindergarten and special education to total elementary enrolment was about 9 per cent and in 1970, it was slightly over 13 per cent.

Similiar reasoning was applied in the secondary enrolment calculation. Here the effect of the participation rate was obtained by comparing the actual enrolment change and the change which would have taken place if the 1950 enrolment/population rate was carried to 1970. The result is consistent with another indicator. Between 1951 and 1970, population change in the 15-19 age group increased by about 220 per cent while secondary enrolment grew by about 420 per cent, a proportion of about half.

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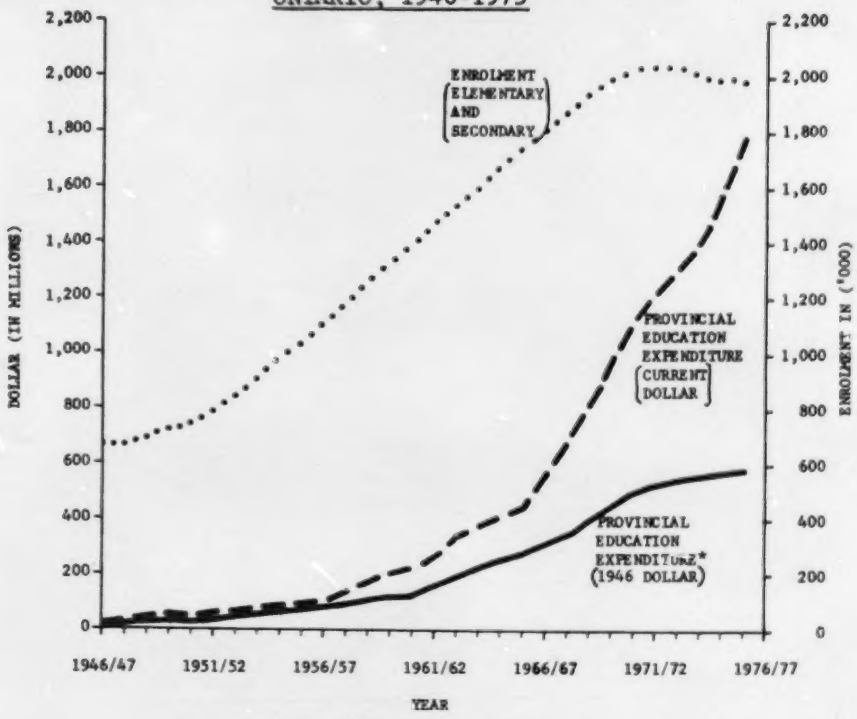
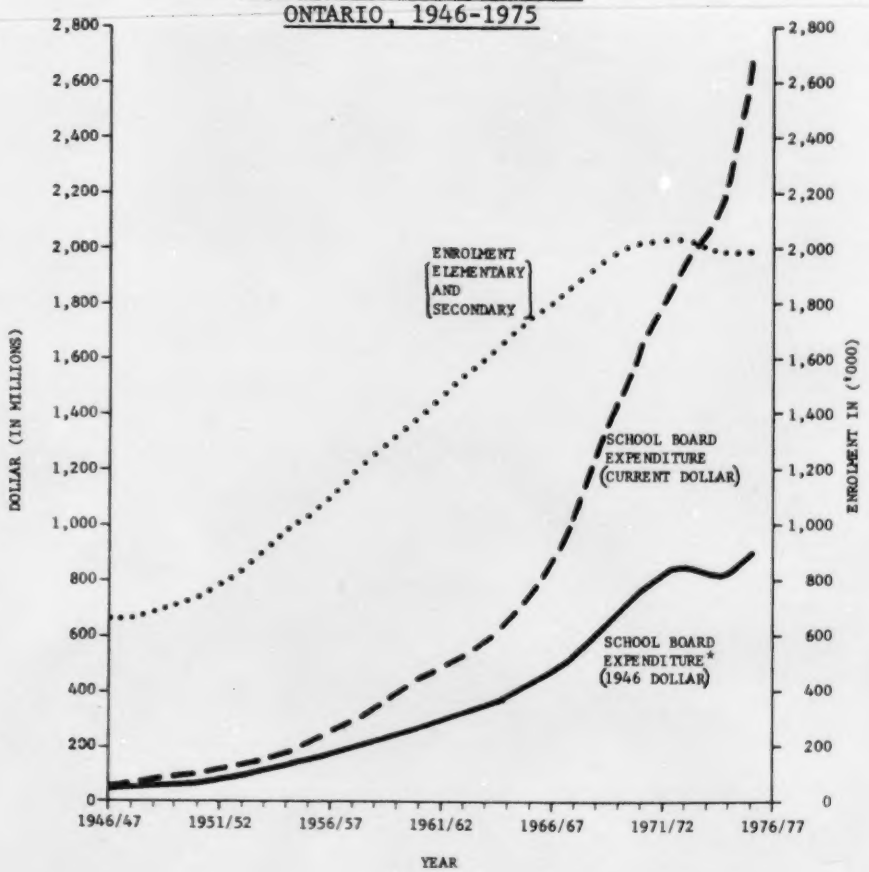
PROVINCIAL EDUCATION EXPENDITURE
ONTARIO, 1946-1975



SCHOOL BOARD EXPENDITURE
ONTARIO, 1946-1975



*Based on the Consumer Price Index since the bulk of the education expenditure is composed of wages and salaries.

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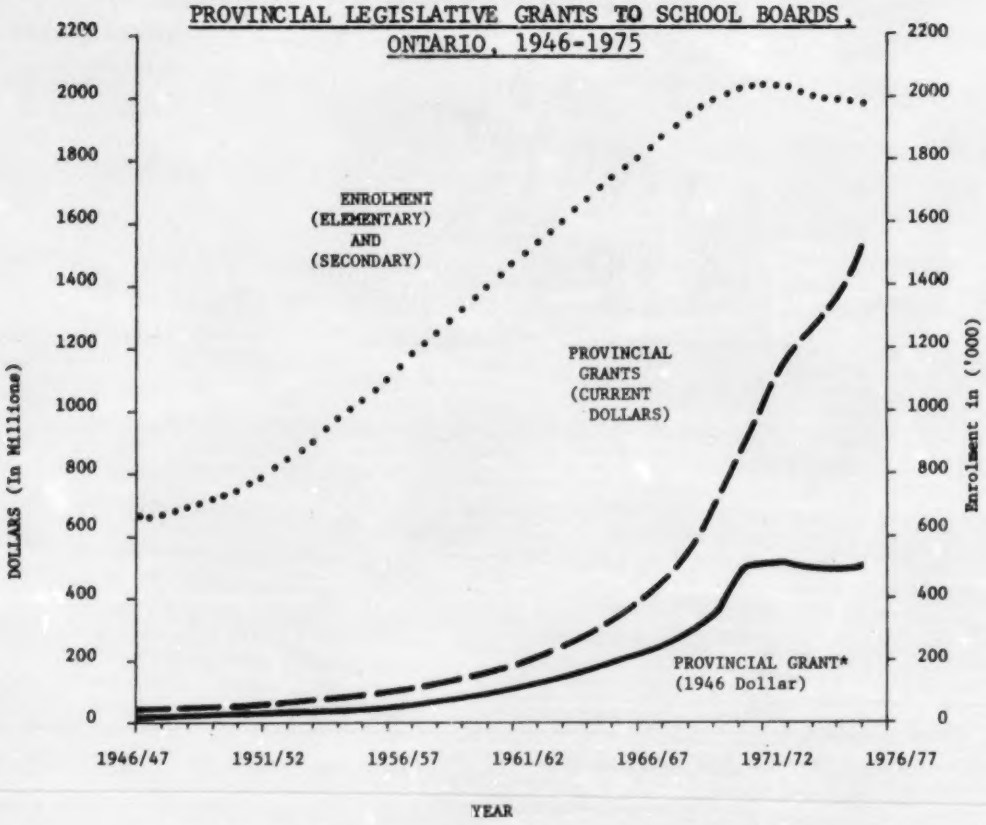
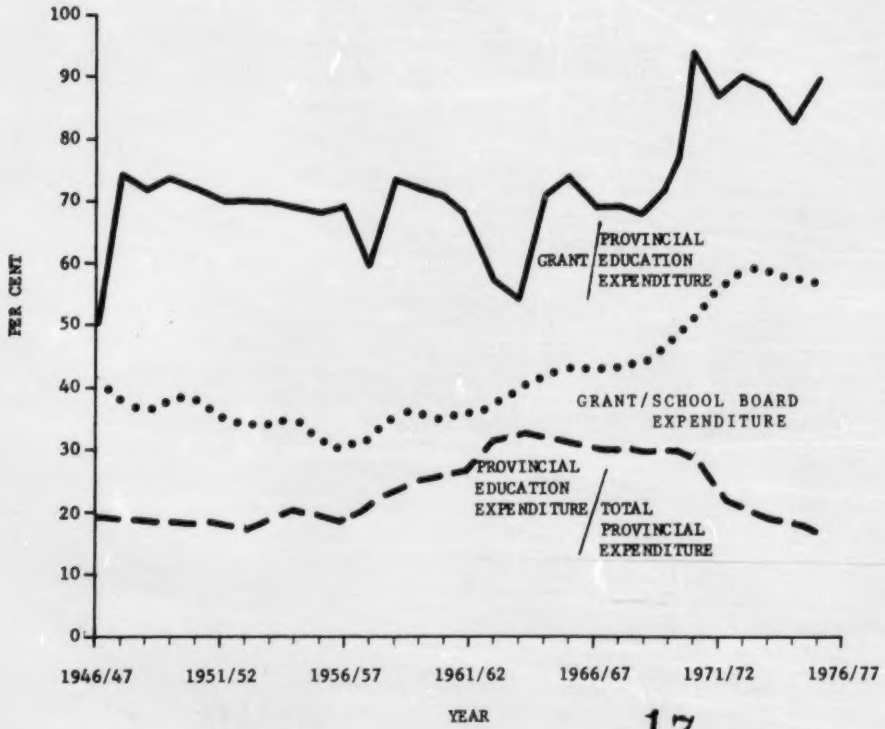
PROVINCIAL LEGISLATIVE GRANTS TO SCHOOL BOARDS, ONTARIO, 1946-1975



* Based on the Consumer Price Index

PROVINCIAL EDUCATION EXPENDITURE (ELEMENTARY AND SECONDARY SCHOOLS) AS A % OF TOTAL PROVINCIAL EXPENDITURE AND LEGISLATIVE GRANTS AS A % OF PROVINCIAL EDUCATION EXPENDITURE, ONTARIO, 1946-1975



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changes have occurred.

- After 1970, most of the expenditure increase was attributable to inflation.
- While the proportion of education expenditure as a per cent of total provincial expenditure has declined fairly sharply (from about 30% in 1970 to slightly under 17% in 1976), the amount of provincial transfer payments received by the school boards did not change appreciably (measured in constant dollars) because of an increase in the grants rates.
- There was a shift in the expenditure burden from the local municipalities to the provincial government whose grant represents nearly 60% of the total school board expenditure as compared with about 40% in the 1960s.

Of the present school board budget, which stood at about 2.7 billion dollars in 1975, the largest item of expenditure was instructional salaries which accounted for 57% of the total respectively (Table 2)*. In the past few years the proportion of expenditures allocated to instruction salaries and supplies has increased, while items such as capital expenditure from revenue, debt charges and others appeared to show a relative decline.

While the enrolment and the expenditure trends displayed very similar patterns, the growth in enrolment was by no means the only major contributing factor to the expenditure requirements. This conclusion can be supported by examining the two largest expenditure components -- instruction salaries and construction of physical facilities --

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* This does not include payment to the teachers' superannuation fund which is a provincial responsibility.

TABLE 2

BREAKDOWN OF SCHOOL BOARD EXPENDITURE, ONTARIO, 1965 TO 1975

ELEMENTARY

YEAR	INSTRUCTION-SALARIES AND FRINGE BENEFITS		INSTRUCTION-SUPPLIES AND OTHER EXPENSES		PLANT OPERATION AND MAINTENANCE		TRANSPORTATION		CAPITAL EXPENDITURE FROM REVENUE		DEBT CHARGES		OTHERS*		TOTAL	
	$'000	%	$'000	%	$'000	%	$'000	%	$'000	%	$'000	%	$'000	%	$'000	%
1965	246,021	54	20,208	5	59,032	13	14,808	3	23,953	5	63,715	14	29,105	6	456,842	100
1966	281,707	53	25,955	5	67,332	13	18,786	4	32,816	6	68,081	13	32,407	6	527,084	100
1967	328,141	53	26,266	4	77,252	12	23,175	4	36,875	6	77,791	13	49,216	8	618,718	100
1968	409,910	55	33,858	4	93,478	12	27,787	4	36,158	5	88,986	12	58,786	8	748,963	100
1969	489,712	57	47,975	6	106,927	12	31,855	4	17,593	2	102,026	12	57,941	7	854,029	100
1970	562,941	58	50,238	5	125,945	13	36,668	4	20,312	2	115,734	12	63,307	6	975,145	100
1971	616,485	59	50,848	5	136,156	13	40,113	4	23,445	2	119,165	11	65,573	6	1,051,785	100
1972	669,479	59	53,794	4	146,536	13	44,808	4	33,942	3	124,260	11	68,499	6	1,141,318	100
1973	710,205	59	50,878	4	155,045	13	49,374	4	32,445	3	130,758	11	68,235	6	1,196,841	100
1974	739,179	56	111,783	8	175,831	13	57,451	4	38,880	3	130,320	10	71,594	6	1,325,038	100
1975	901,213	56	141,709	9	218,045	14	69,656	4	55,432	3	133,768	8	88,777	6	1,608,600	100

SECONDARY

1965	167,962	56	18,581	6	33,305	11	10,718	3	13,660	4	29,457	10	27,309	9	300,992	100
1966	198,617	57	20,118	6	38,622	11	11,615	3	17,463	5	32,437	9	32,491	9	351,363	100
1967	236,807	55	21,749	5	46,901	11	12,678	3	21,537	5	40,277	9	49,475	12	429,424	100
1968	294,829	57	27,328	5	57,141	11	14,053	3	22,835	5	45,785	9	51,446	10	513,417	100
1969	364,106	60	39,910	7	67,217	11	20,130	3	14,030	2	50,533	9	47,099	8	603,025	100
1970	416,810	61	41,025	6	79,722	12	22,458	3	18,260	3	57,250	8	50,351	7	685,876	100
1971	461,161	61	41,510	6	87,708	12	24,538	3	20,698	3	60,156	8	53,699	7	749,470	100
1972	506,040	62	44,095	5	95,709	12	26,640	3	21,851	3	66,090	8	54,717	7	815,142	100
1973	532,278	62	43,363	5	102,260	12	27,866	3	24,890	3	68,570	8	55,741	7	854,968	100
1974	544,532	58	89,842	10	115,351	12	31,548	3	24,709	3	69,838	7	61,619	7	938,439	100
1975	628,184	58	108,189	10	139,086	12	37,075	3	28,888	3	73,254	7	74,434	7	1,089,110	100

ELEMENTARY AND SECONDARY

1965	413,983	55	38,789	5	92,337	12	25,526	3	37,613	5	93,172	12	56,414	8	757,834	100
1966	480,324	55	46,073	5	105,954	12	30,401	4	50,279	6	100,518	11	64,898	7	878,447	100
1967	564,948	54	48,015	5	124,153	12	35,853	3	58,412	6	118,070	11	98,691	9	1,048,142	100
1968	704,739	56	61,186	5	150,619	12	41,840	3	58,993	5	134,771	11	110,232	8	1,262,380	100
1969	853,818	59	87,885	6	174,144	12	51,985	4	31,623	2	152,559	10	105,040	7	1,457,054	100
1970	979,751	59	91,263	6	205,667	12	59,126	4	38,572	2	172,984	10	113,658	7	1,661,021	100
1971	1,077,646	60	92,358	5	223,864	12	64,651	4	44,143	2	179,321	10	119,272	7	1,801,255	100
1972	1,175,519	60	97,889	5	242,245	12	71,448	4	55,793	3	190,350	10	123,216	6	1,956,460	100
1973	1,242,483	60	94,241	5	257,305	12	77,240	4	57,335	3	199,229	10	123,976	6	2,051,809	100
1974	1,283,711	56	201,625	9	292,182	13	88,999	4	63,589	3	200,158	9	133,213	6	2,263,477	100
1975	1,529,397	57	249,898	9	357,131	13	106,731	4	84,320	3	207,022	8	163,211	6	2,697,710	100

*Includes expenditures on business administration, computer services, education services, attendance, health and food services, adult education, non-operating and other operating expenditures.

Computed on the basis of data from Education Statistics, Ministry of Education, Ontario.

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May 1978

which together accounted for more than two-thirds of the total school board budget.*

Between 1965 and 1975, spending on instruction salaries in the elementary and secondary school systems rose from about 0.4 billion to over 1.5 billion dollars. Of the 1.1 billion dollar increase, just slightly over 10% of the total can be attributed to the impact of enrolment, while inflation, teachers' salary increments and changes in the pupil/teacher ratio account for the bulk of the increase (Table 3).*

In the area of construction of facilities, changes in education policy were also responsible for a fairly significant portion of the expenditure. In the past 25 years, the province has spent over three billion dollars in the construction of facilities to provide over two million new pupil places (Appendix 3). While the main thrust of the outlay was to construct sufficient new places to satisfy the needs generated by the enrolment increase, a substantial part of the building program was aimed at compensating for the loss of school places resulting from the consolidation of small units into central schools and the replacement of some of the older and more obsolete structures. About two-thirds of all the pupil places constructed up to 1971 were

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* The expenditure on the construction of facilities is reflected in capital expenditure from revenue and debt charges (see Table 2).

** In fact, the effect of changes in the pupil/teachers ratio entailed a larger number of teachers required than those resulting from the increase in enrolment (14,000 versus 12,000).

TABLE 3

PER CENT DISTRIBUTION OF INSTRUCTION SALARIES AND FRINGE BENEFITS EXPENDITURE BY COMPONENTS, ELEMENTARY AND SECONDARY SCHOOLS, ONTARIO, 1965-1975

COMPONENT	ELEMENTARY		SECONDARY		ELEMENTARY AND SECONDARY	
	INCREASE IN $	% OF TOTAL	INCREASE IN $	% OF TOTAL	INCREASE IN $	% OF TOTAL
Inflation*	377,252,000	57.6	262,960,700	57.1	640,212,700	57.4
Enrolment Increase**	21,482,400	3.3	101,532,100	22.1	123,014,500	11.0
Changes in Pupil/ Teacher Ratio***	97,456,700	14.9	35,791,900	7.8	133,248,600	12.0
Teacher Salary Increase****	159,000,000	24.2	59,937,300	13.0	218,937,300	19.6
Total	655,191,100	100.0	460,222,000	100.0	1,115,413,000	100.0

* Based on the Consumer Price Index which increased 72% from 1965-1975 rather than on the basis of Implicit Price Index (IPE) on government expenditure on goods and service because the bulk of education expenditure is in the form of salaries and wages.

** This component represented the salaries required to support the additional teachers incurred by the enrolment increase. Elementary and secondary enrolment increased by 69,440 and 186,420 respectively between 1965-1975.

*** This component represents the salaries required to support the additional teachers incurred by a lowering of the pupil/teacher ratio. In the elementary school system the crude pupil/teacher ration based on full-time teachers declined from 29.4 in 1965 to 23.9 in 1975 while the secondary school system the ratio declined from 19.3 in 1965 to 17.4 in 1975. (See Appendix I).

**** Average annual salaries for elementary school teachers increased from about $5,470 per year in 1965 to $15,490 per year in 1975. The figures for secondary school teachers were $7,750 per year in 1965 and $18,040 per year in 1975. For a comparison of changes in salaries between teachers and other industries, see Appendix 2.

This expenditure component includes increased teachers salaries over and above inflation and the amount resulting from increased qualifications and experience.

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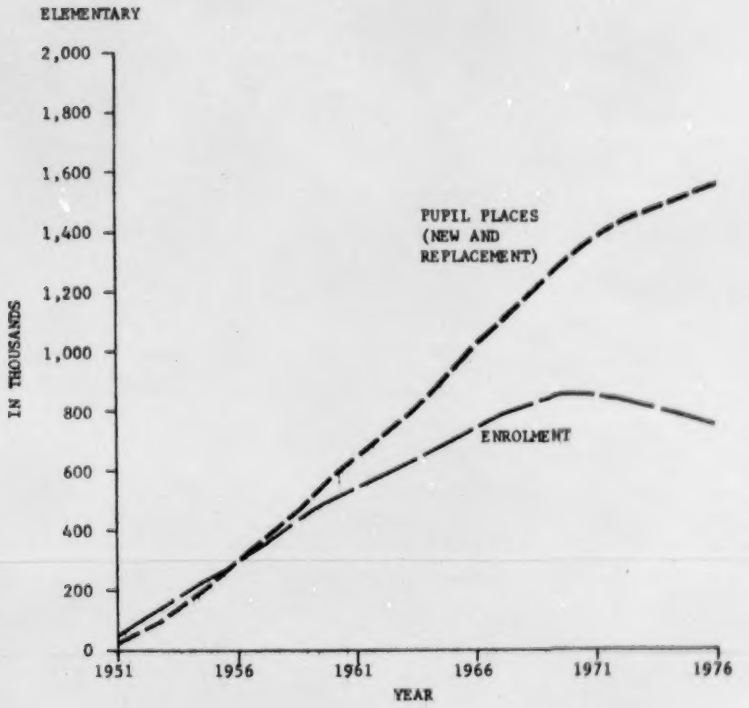
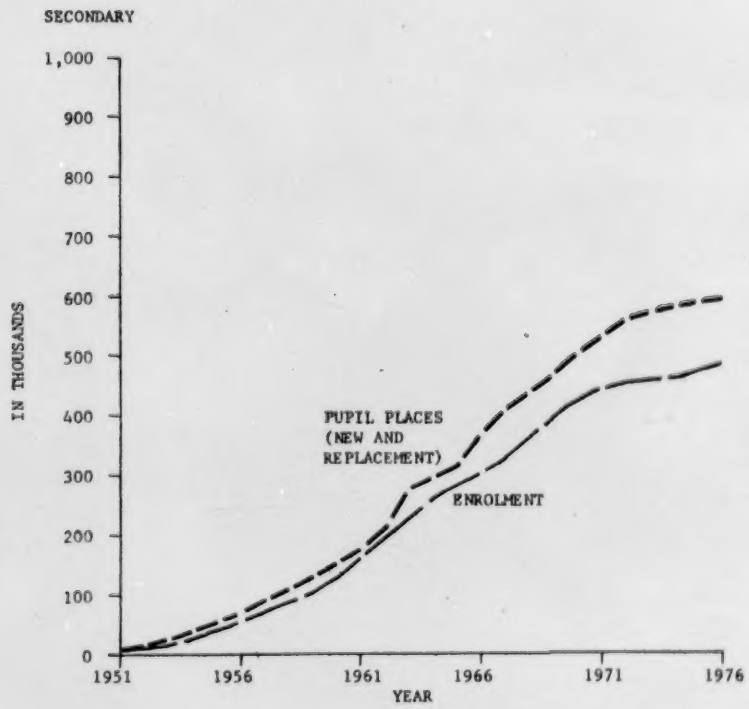
for accommodation of new enrolment and the rest was for replacement and school consolidation purposes (Figure 4).

Taking into account all the components of school expenditure (for example, instruction salaries, supplies and facilities), about a fifth of the school board expenditure increase which occurred between 1965 and 1975 can be attributed to the impact of enrolment.

FIGURE 4

ACCUMULATED CHANGE IN ENROLMENT AND PUPIL PLACES
(NEW AND REPLACEMENTS), ONTARIO 1951-1976





SOURCE: Based on data from Education Statistics, Ministry of Education

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(III) FUTURE SCHOOL ENROLMENT

Elementary and secondary school enrolment projections were prepared for various parts of Ontario up to the year 2001. A detailed description of the methodology, assumptions and results were included in a separate TEIGA staff report prepared for the Commission on Declining School Enrolments (CODE)*. The following is a summary of the major findings:

- Decline in fertility rate and in the number of women in the main child-bearing age groups will result in further decrease in the number of new births.
- Elementary enrolment in the province is expected to decline by slightly more than 100,000 between 1976 and the early 1980's (Figure 5). Beyond that date, the trend is expected to reverse. However, the rise will be very moderate and the peak which is expected to occur around 1996 is still below the present enrolment level (by about 4%).
- Apart from two or three locales, southwestern, eastern and northern Ontario are expected to experience continued enrolment declines. For some of the counties, the decline could amount to between 30 and 40% between now and the turn of the century. On the other hand, enrolment in a few counties, mainly in the central Ontario region (e.g., Peel, Dufferin) is expected to increase continuously at a fairly rapid rate (Figure 6).
- A pattern similar to that for the elementary schools is displayed by the secondary enrolment trend (Figures 7 and 8). However, the decline is likely to be more extensive, both in territory and in degree than that in the elementary schools. Enrolment in the province is expected to decline by about 100,000 (or 17%) between 1976 and 1991 before the trend is reversed. However, the rise will be very moderate and the projected provincial enrolment in 2001 will still be more than 10% below the present level.

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* The Effect of Demographic Change on Enrolment and Use of School Facilities in Ontario to the Year 2001, op cit.

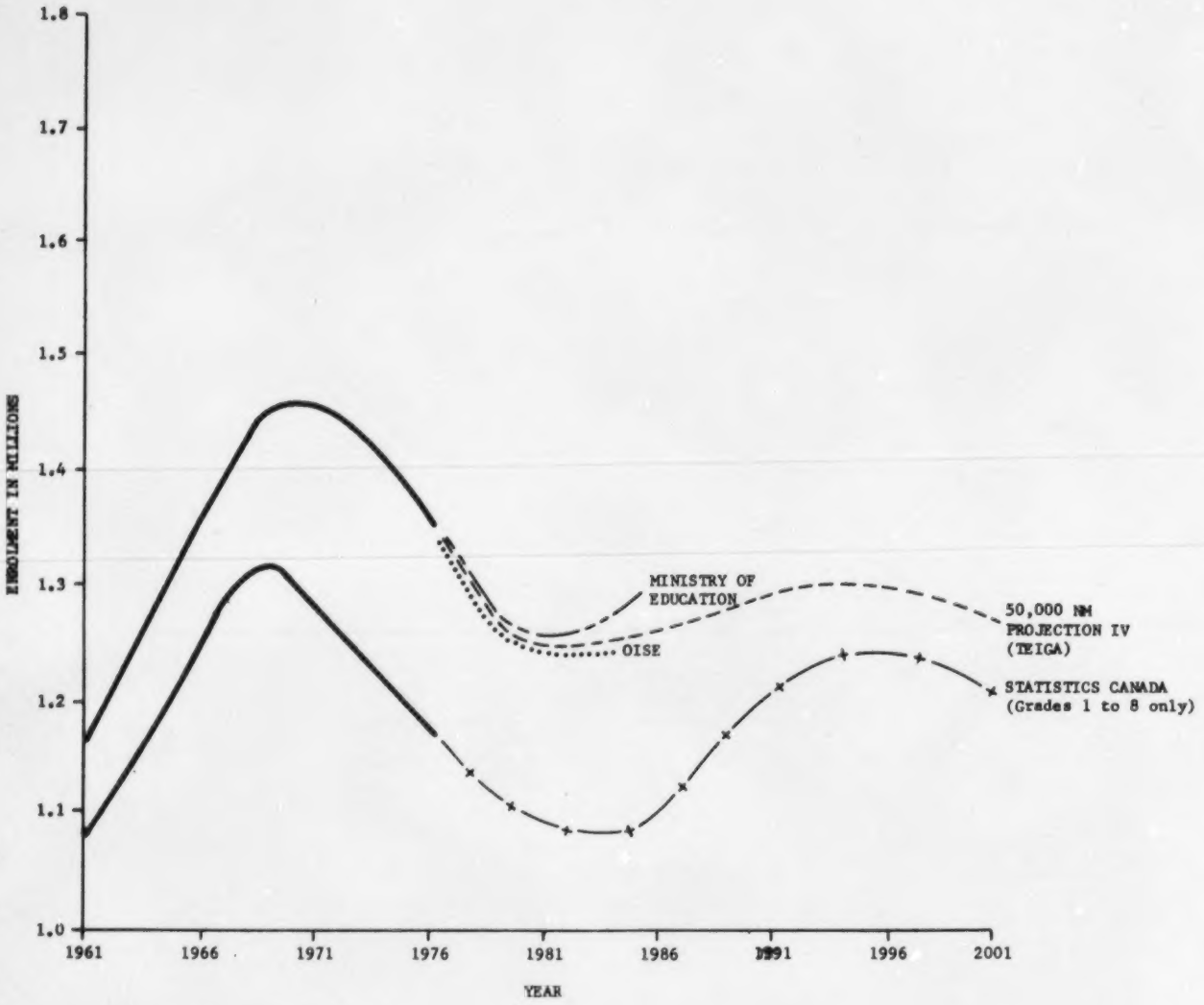
FIGURE 5

COMPARISON OF ENROLMENT TRENDS

PREPARED BY VARIOUS AGENCIES,

ELEMENTARY SCHOOL, ONTARIO,

1961 TO 2001



NOTE: NM - Net Migration Per Year

The TEIGA elementary school projection shown here was obtained by summing all the county figures. The same procedure was also applied to the OISE projection. However, due to changes in municipal boundaries OISE has left out two counties (Durham and Northumberland) in the elementary school system and five counties (Durham, Northumberland, Peterborough, Simcoe and Victoria) in the secondary school system. To obtain the full provincial picture, an estimate was made for the left out counties and then added on to the partial total. In the case of OISE a separate overall provincial projection was also made. Comparing this separate provincial total with the one obtained by the county aggregation, it was discovered that the former estimate was about 50,000 higher.

In the secondary school system the difference in the projections produced by aggregating the counties and by separate provincial estimate was only marginal.

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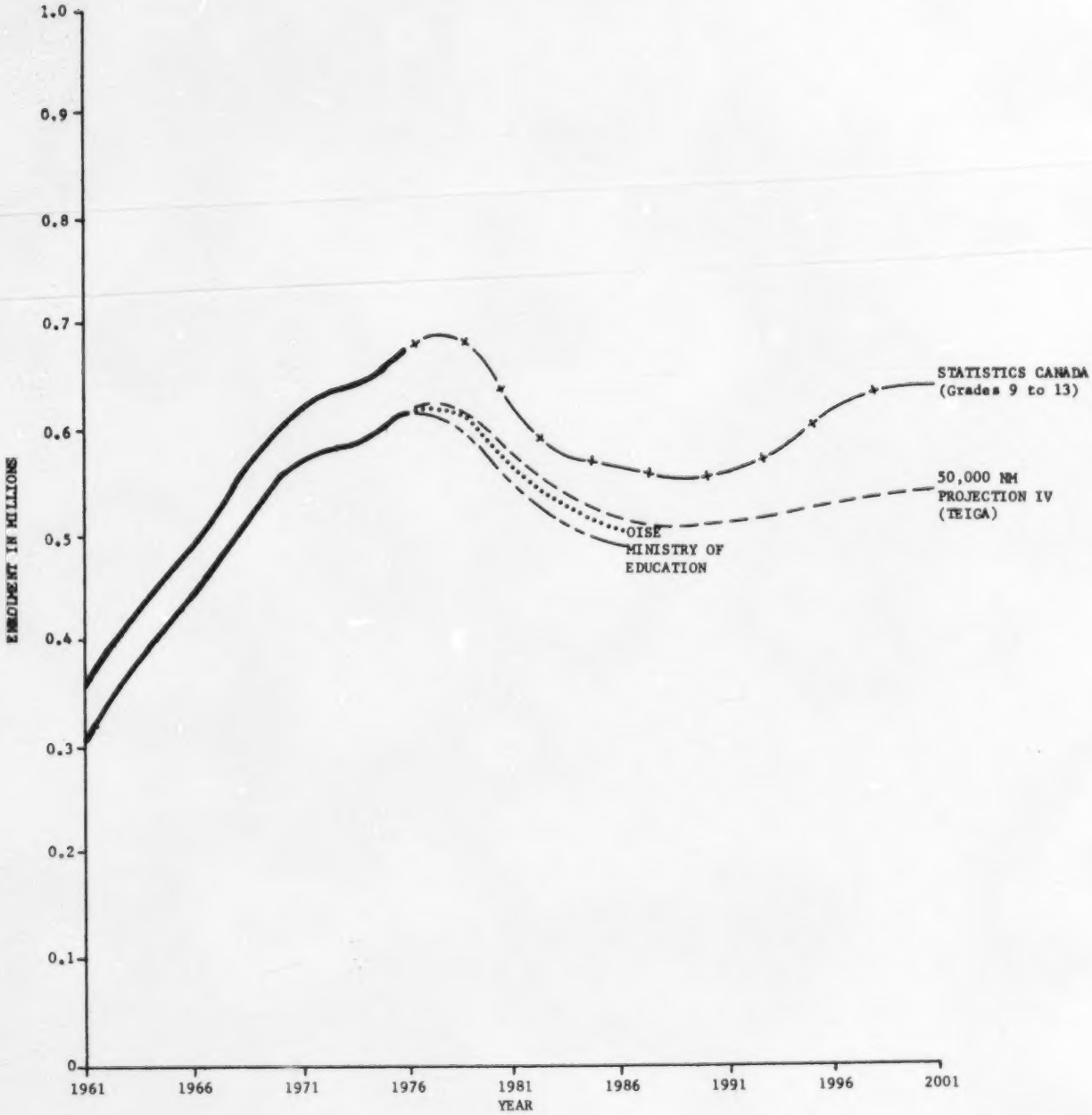
FIGURE 6

COMPARISON OF ENROLMENT TRENDS

PREPARED BY VARIOUS AGENCIES,

SECONDARY SCHOOL, ONTARIO

1961 TO 2001



NOTE: NM - Net Migration Per Year
See footnote in Figure 12

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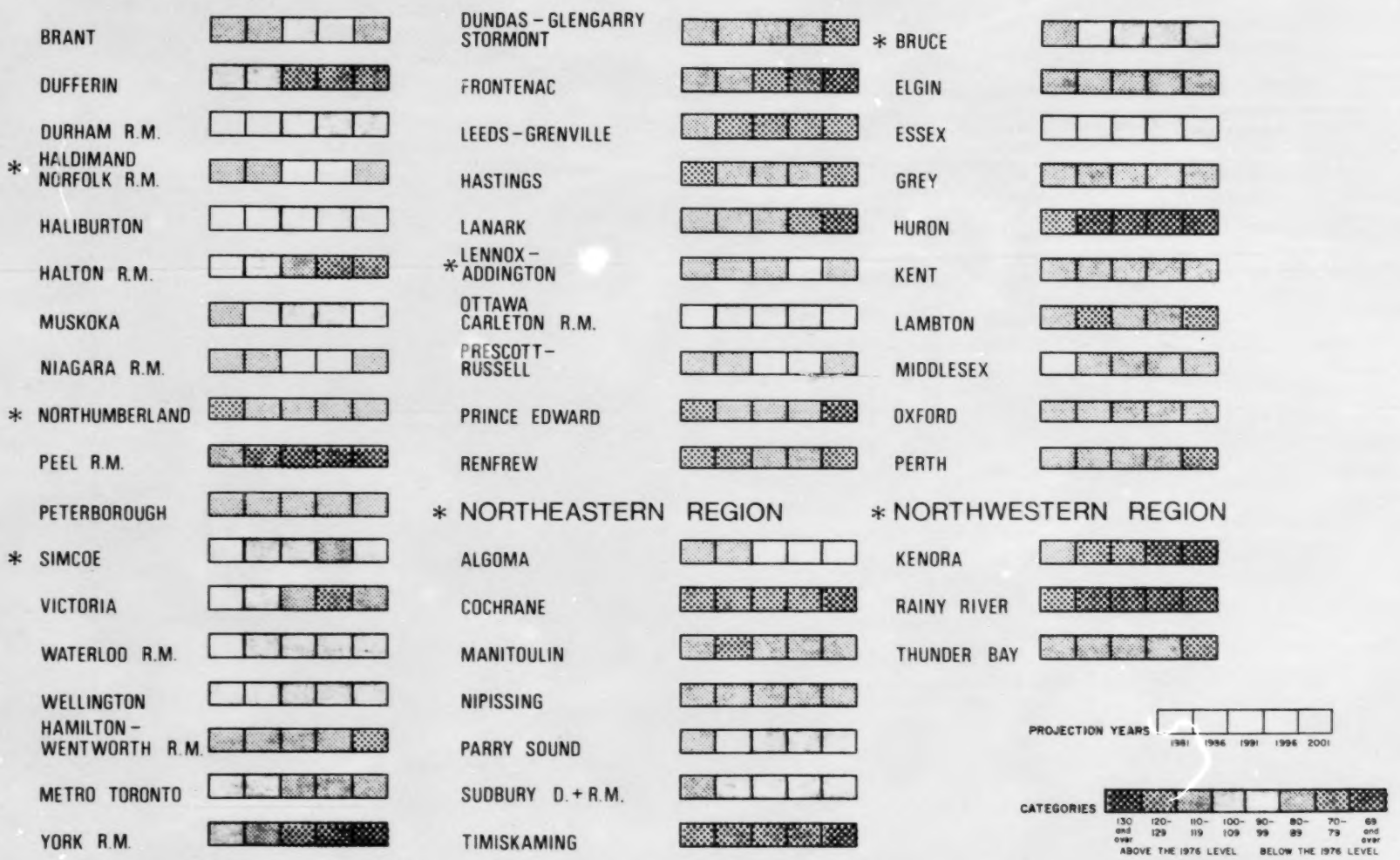
PROJECTED COUNTY ENROLMENT AS A % OF THE 1976 LEVEL, ELEMENTARY SCHOOL, 1981 TO 2001, PROJECTION IV (50,000 NET MIGRATION, SERIES B FERTILITY ASSUMPTION)



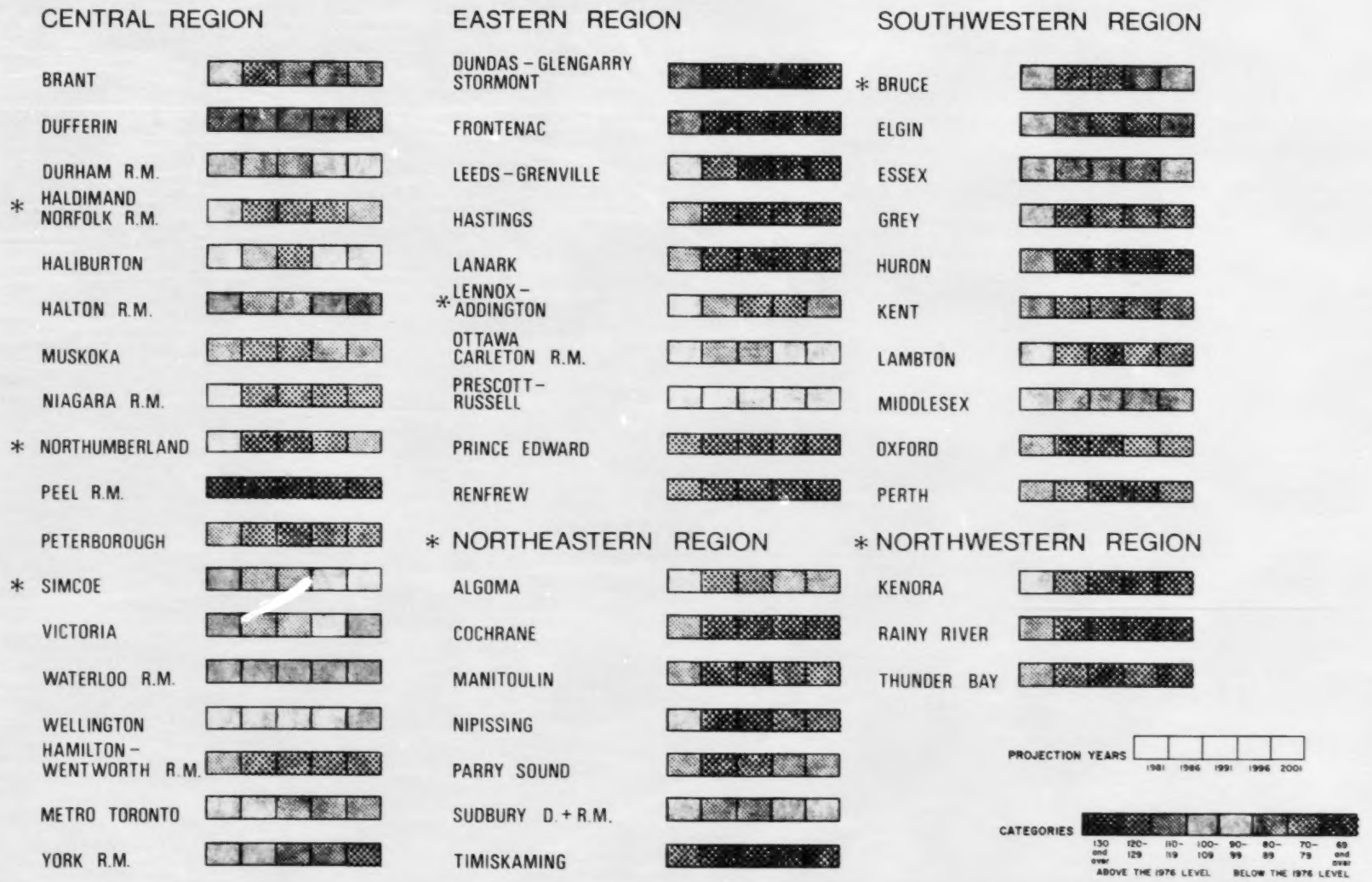
SOURCE: SOCIAL AND ECONOMIC DATA, CENTRAL STATISTICAL SERVICES, MINISTRY OF TREASURY, ECONOMICS, AND INTERGOVERNMENTAL AFFAIRS, 1977

Note: Impact of Development Projects were not included.

* Areas with proposed and/or Committed Development Projects

Figure 7

PROJECTED COUNTY ENROLMENT AS A % OF THE 1976 LEVEL, SECONDARY SCHOOL, 1981 TO 2001, PROJECTION IV (50,000 NET MIGRATION, SERIES B FERTILITY ASSUMPTION)



SOURCE: SOCIAL AND ECONOMIC DATA, CENTRAL STATISTICAL SERVICES, MINISTRY OF TREASURY, ECONOMICS, AND INTERGOVERNMENTAL AFFAIRS, 1977

Note: Impact of Development Projects were not included

* Areas with proposed and/or Committed Development Projects

Figure 8

(IV) DIRECTION OF FUTURE EDUCATION EXPENDITURE*

A) Instruction - Salaries and Benefits

Continuing decline in school enrolment in the next few years may not necessarily result in any reduction in this expenditure component. Based on the projected level of enrolment, and assuming the pupil/teacher ratio remains at the present level, the total number of teachers required (elementary and secondary) should drop by about 6,000 between 1976 and 1981. This reduction is equivalent to about $100 million or 4% of entire school board expenditure in 1975. However, the effect of a number of factors may offset completely or perhaps more than offset the expenditure reduction resulting from the decrease in enrolment.

- Further Reduction in Pupil/Teacher Ratio

  The pupil/teacher ratio in elementary schools continued to show a slight decline while it remained fairly stable in the secondary school system over the past few years. Present pupil/teacher ratio could very well decline further through a change in education policy and/or by necessity. The latter situation may develop in those areas where the drop in enrolment is so extensive that it becomes extremely difficult to maintain the present level of pupil/teacher ratio even with special arrangements.**

---

* The effect of inflation on expenditure was excluded in the discussion since this item applies to all the components.

** An example of these arrangements is more extensive use of split classes.

- Increased Years of Experience and Qualifications of Teachers

Teachers' salaries are ranked by years of experience and categories which are related primarily to academic qualifications. Variations in salaries resulting from differences in academic qualifications in secondary school ranged from about 20 to 40%, while in the elementary schools, the variations could be as high as 170% (Table 4). Thus, although the total number of teachers remained the same, the total expenditure would still increase if the teachers continue to upgrade their qualifications.*

A similar situation also develops as teachers increase their length of service. The present schedule is such that teachers in all categories receive automatic salary increments as their length of service increases up to about the eleventh year when the salary scale begins to stabilize. In 1976, about 30% of elementary school teachers and 40% of secondary school teachers had a length of service of 11 years and over (Figure 9). By 1981, it is expected that the proportion of this group of teachers will increase at least to 50% and 60% for elementary and secondary school teachers respectively if the withdrawal and acquisition characteristics of teachers in the next few years are not drastically different from those in the past few years.** Based on the total number of teachers and the salary scale in 1976, an increase in the number of teachers with more years of experience will entail additional expenditure requirements in the order of $250 million in the next five years (Figure 10).***

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* Formerly, many new teachers entered the system at low-category levels. However, because of the degree requirement for entry to Teachers' Colleges, new teachers enter the system now at mid-category.

** 1) This is assuming that school boards replace the positions with similarly qualified teachers. Also the withdrawal rate may decrease in the face of declining school enrolment.

2) For details on the characteristics of teachers' withdrawal and acquisition, see Education Statistics, Ministry of Education. It should be noted that a) leaving for family responsibilities and retirements were the two largest groups, and b) the number of withdrawals and acquisitions in a number of groups tended to cancel each other (for example the number of teachers entering and leaving Ontario).

3) The projection was done on the basis of the following formula:

$$N_i = N_{i-1} - W_i + A_i$$

Where i = year number
N = Number of teachers by years of experience in the system
W = Number of teachers who withdrew from the system
A = Number of teachers who entered the system.

*** The figures do not include the effect of inflation.

TABLE 4

PROVINCIAL SALARY SCHEDULE
ELEMENTARY AND SECONDARY SCHOOL TEACHERS, 1975/1976

ELEMENTARY

YEARS OF EXPERIENCE	SALARIES INDEX (CATEGORY 1 AND 0 YEARS OF EXPERIENCE = 100)							
	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8
0	100	109	117	126	143	148	165	174
1	107	116	125	134	153	160	175	185
2	114	126	135	145	164	172	188	198
3	120	134	143	153	173	181	198	208
4	126	141	151	162	182	191	209	219
5	129	149	159	170	192	201	219	230
6	132	157	169	181	203	213	232	244
7	132	159	177	190	212	222	242	253
8	132	160	183	199	222	232	252	264
9	132	160	188	207	231	241	262	275
10	132	160	188	214	240	251	273	286
11	132	160	188	215	243	256	283	296
12	132	160	188	216	244	258	287	304
13	132	160	188	216	245	259	288	306
14	132	160	188	216	245	259	288	307
15	132	160	188	216	245	259	288	307
16	132	160	188	216	245	259	288	307

SECONDARY

0	100	105	115	121
1	106	111	122	128
2	114	119	131	137
3	121	126	138	145
4	127	133	146	153
5	134	140	153	160
6	142	148	162	170
7	148	155	169	177
8	155	162	177	185
9	161	168	184	193
10	167	175	191	200
11	169	178	198	208
12	170	179	200	212
13	170	179	200	213
14	170	179	200	213
15	170	179	200	213
16	170	179	200	213

C - Category

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FIGURE 9

PER CENT DISTRIBUTION OF TEACHERS BY YEARS OF EXPERIENCE
ELEMENTARY AND SECONDARY SCHOOLS
ONTARIO, 1976, 1981 AND 1986

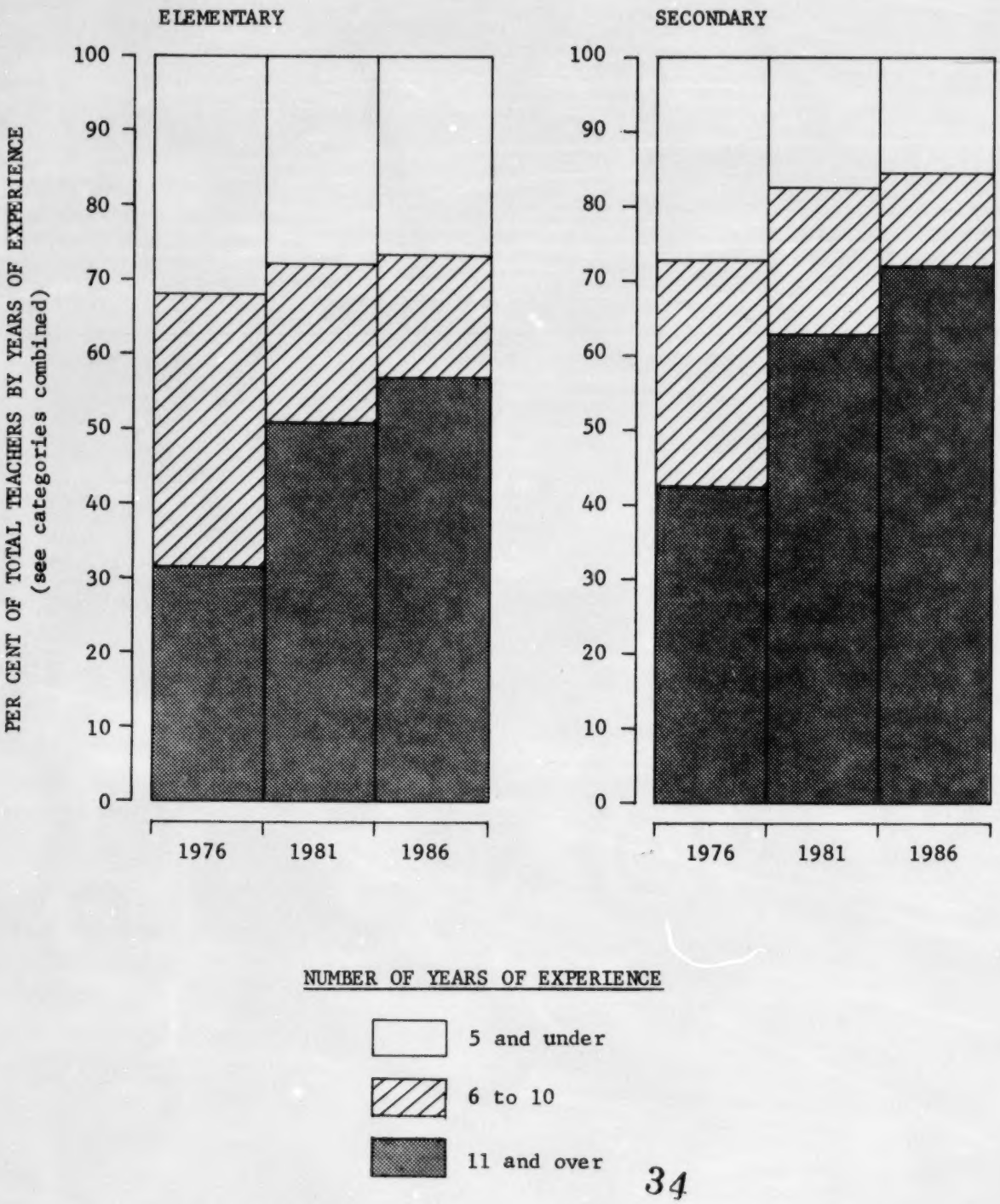

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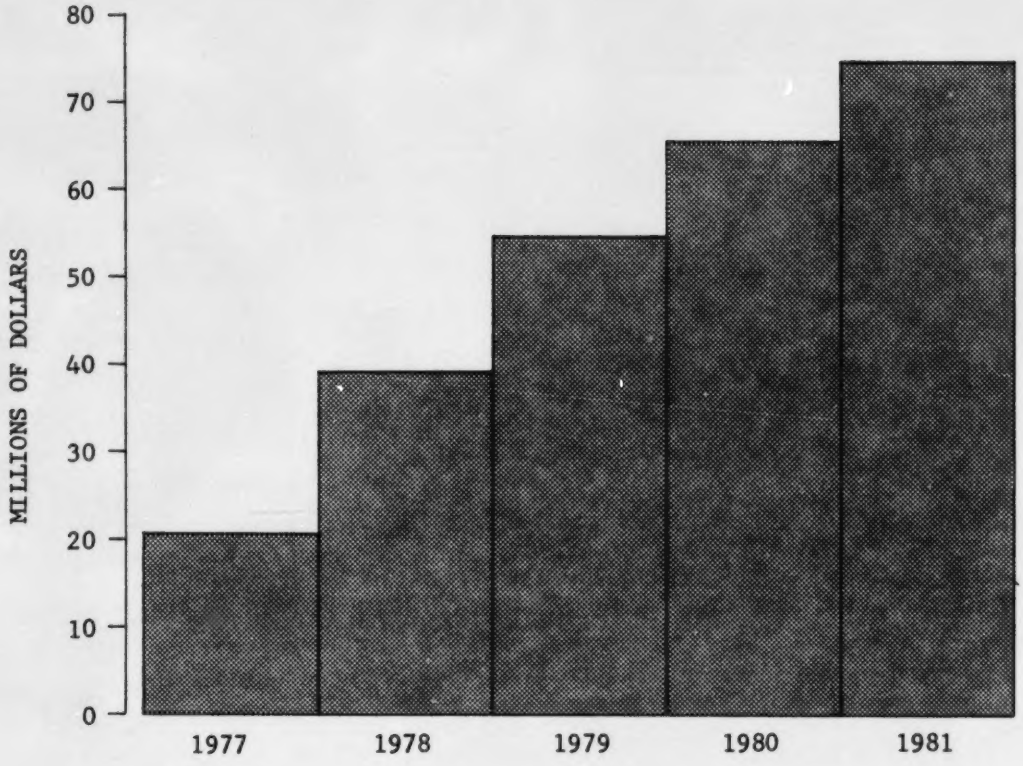
FIGURE 10

ADDITIONAL EXPENDITURE RESULTING FROM
INCREASE IN THE LENGTH OF SERVICE OF TEACHERS
ELEMENTARY AND SECONDARY SCHOOLS
ONTARIO, 1976-1981



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- **Larger Expenditure Component Resulting from Revision of Salary Schedule**

  Teachers' salary schedules are revised upward periodically to reflect a number of changes (for example, cost of living). Given a certain rate of adjustment, the amount of expenditure incurred in the future will be higher because the number of teachers in the higher salary brackets has increased, a result of improved teachers' qualifications and/or increased length of service.

B) Facilities Construction, Operation and Maintenance

As the second largest expenditure component, construction, operation and maintenance of facilities account for about a quarter of the current total school board budget. In the staff report prepared for the Commission on Declining School Enrolments in Ontario, it was concluded that, except in a few locations, existing school facilities should be sufficient to accommodate the projected level of enrolment for the balance of the century.* In many areas, there will be surplus capacity. It is expected that about two-thirds of all elementary and three-quarters of all secondary schools analyzed will be operating at 75% or less of their capacities in the future.** Implicitly, this suggests that capital expenditure which began to decline in the early 1970s will

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* The effect of Demographic Change on Enrolment and Use of School Facilities in Ontario to the year 2001, op cit.

** The conclusions referred mainly to all parts of the province except northern Ontario and the Toronto-Hamilton urban complex (i.e., the Regional Municipalities of Durham, York, Metro Toronto, Peel, Halton and Hamilton/Wentworth).

probably continue this trend in the future. Leaving aside the issue of school closures, however, a number of factors could prevent any significant reduction in this expenditure component, at least for a number of years.

- A number of areas in the province (for example, Peel, Dufferin) will continue to require new capital expenditure because of shifts in geographic distribution of population. Because of geography, and jurisdictional problems, surplus capacity existing in one area may not be available for accommodating enrolment increase in another area.

- A considerable portion of new construction was financed by debenture issues which generally have an amortization period of 20 to 25 years. Since the bulk of capital expenditure took place during the 1960s and the beginning of the 1970s, the burden of debt charges will not be significantly eased until the mid 1980s (Figure 11).

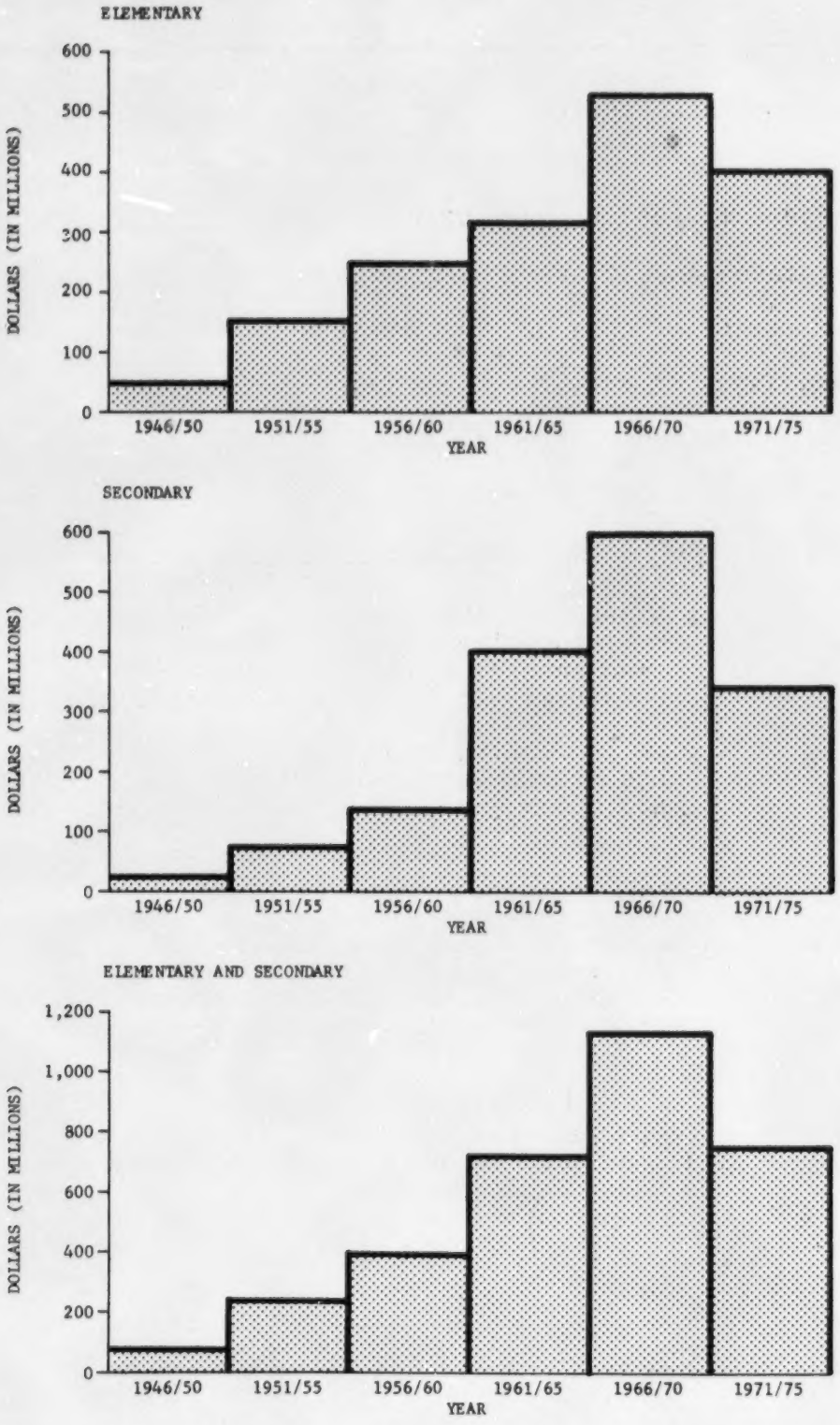
- Towards the end of the 1980s, expenditure on plant maintenance will probably start to increase. By that time, most of the facilities will be more than 25 years old and increased repair and maintenance costs may be expected.

C) Other School Board Expenditure Components

To determine the effect of enrolment on the remaining expenditure components would require more detailed data and analysis. In general, declining school enrolment could entail some reduction in the expenditure on instruction supplies (in constant dollars). However, the cost of transportation is probably more related to decision on school closing and the pricing of energy in the future.

FIGURE 11

SCHOOL BUILDING CONSTRUCTION COST
(AT TENDER STAGE) ONTARIO, 1946-1975



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D) Expenditure Related to Teachers' Pensions*

In the past two decades, rapid growth in enrolment coupled with a corresponding reduction in the pupil/teacher ratios have resulted in more than a twofold increase in the number of elementary and secondary teachers, from about 40,000 in 1957 to over 93,000 in 1975 (Figure 12A).** As a consequence, a very high proportion of the teaching force is relatively young. In 1975, the median age of teachers was about 32 and 60% of all teachers were in the age bracket of 35 and under (Figure 12B). Pensions were not a major expenditure concern before 1974/75. However, the picture might change in the future.

- Average teachers' salaries have grown substantially in the past few years thus entailing an increasing contribution requirement.***
- An increasing number of teachers in the older age brackets, as the bulge of the 35 years old and under group moves along the time continuum.

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* The employer's share of costs for the teachers' superannuation fund is born by the provincial government and was not included as part of school board expenditure. In the printed estimates for fiscal 1978/79, this amounted to about $330 million.

** Refers to full-time teachers

*** Between 1965 and 1975, average salaries of elementary and secondary teachers have increased by about 2.8 and 2.3 times respectively. (see footnote in Table 3).

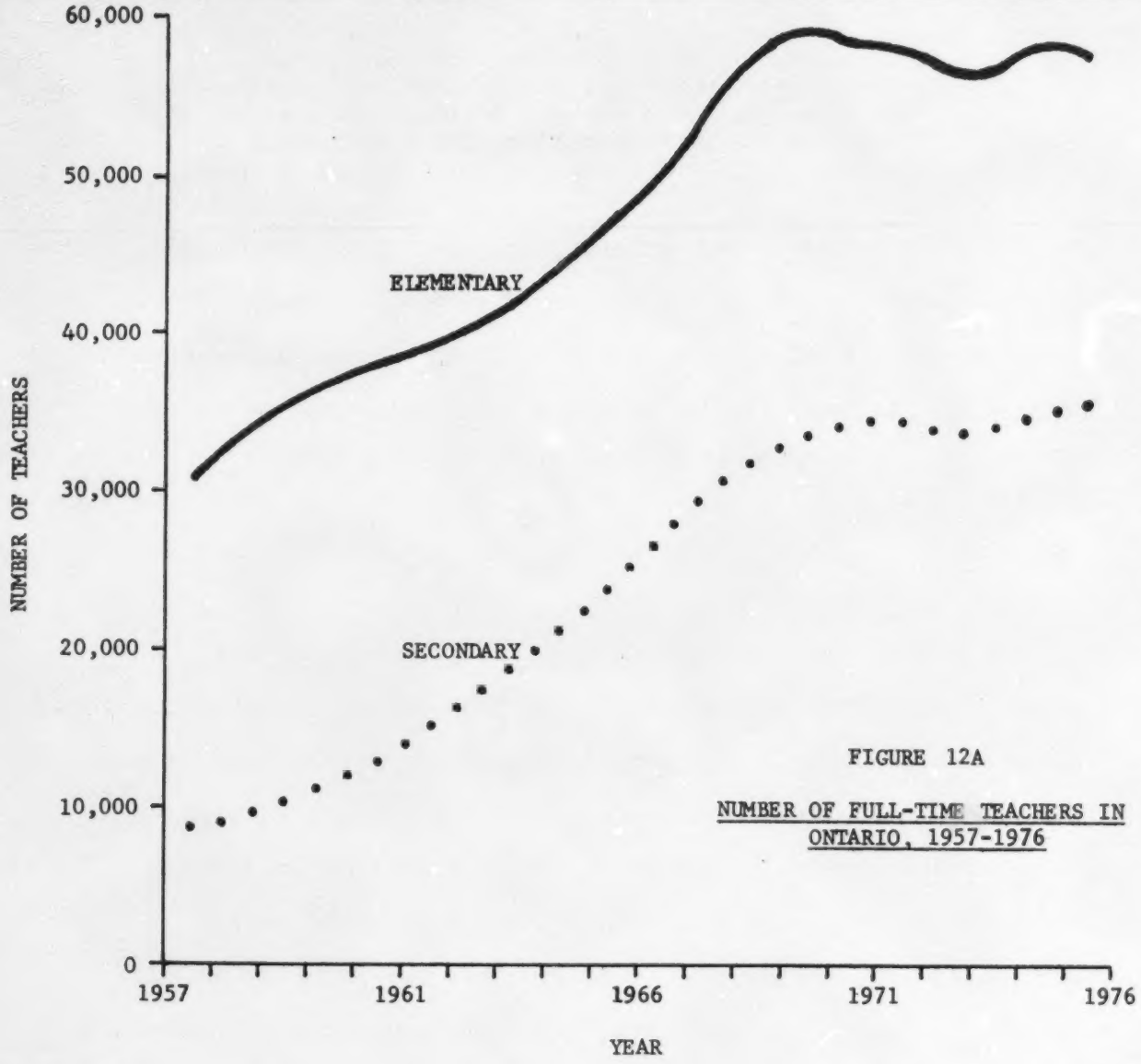

FIGURE 12A

NUMBER OF FULL-TIME TEACHERS IN ONTARIO, 1957-1976

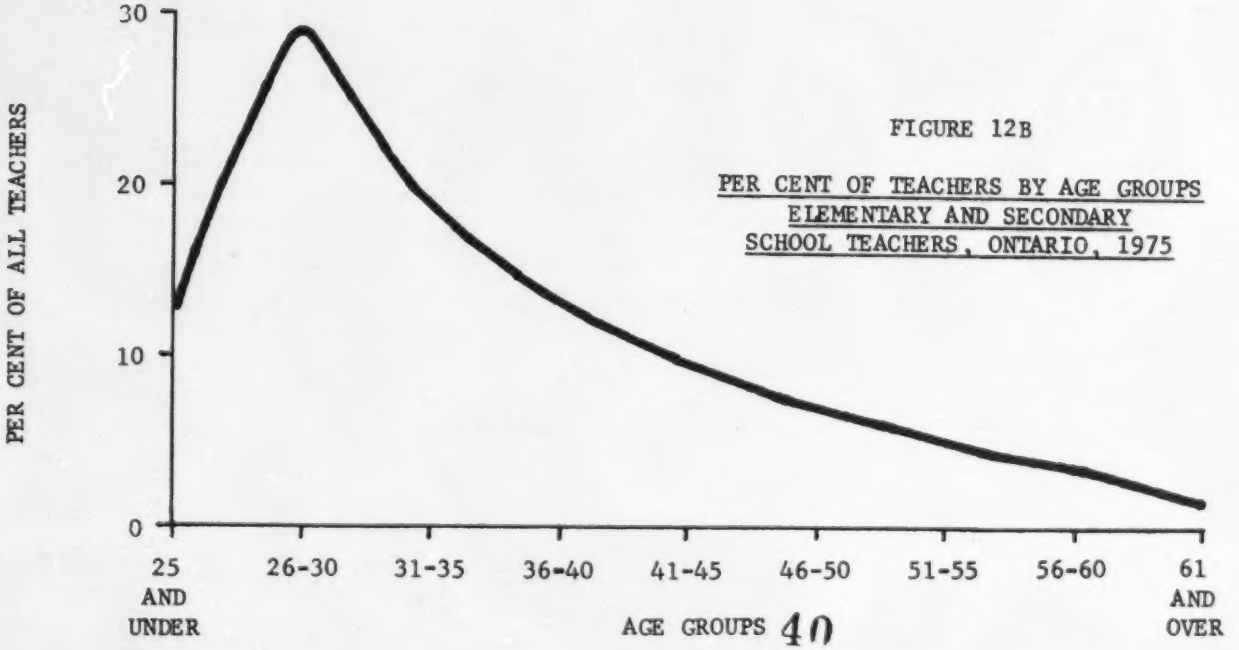

FIGURE 12B

PER CENT OF TEACHERS BY AGE GROUPS ELEMENTARY AND SECONDARY SCHOOL TEACHERS, ONTARIO, 1975

- Declining school enrolment is likely to increase further the proportion of teachers in the older age groups relative to the younger age groups because of a decreasing number of young teachers entering the system.

The above developments could lead to some major implications for financing teachers' pensions especially towards the end of the century. By 2005, it is expected that about 15% of all the teachers will reach age 56 or higher compared with about 5% in 1975 (Figure 13).

E) CONCLUSION

The analysis indicates that, assuming present policies continue to operate, even discounting inflation, elementary and secondary school expenditure will likely rise in the next few years in spite of the continuing decline in school enrolment. In the 1980s, the retirement of some debentures (for example, those issued during the 1960s' capital expansion period) would help to reduce the rate of growth in capital expenditure. However, expenditure associated with pensions is expected to become more critical because of increased teachers' salaries and aging of the teaching labour force, especially towards the end of the century.

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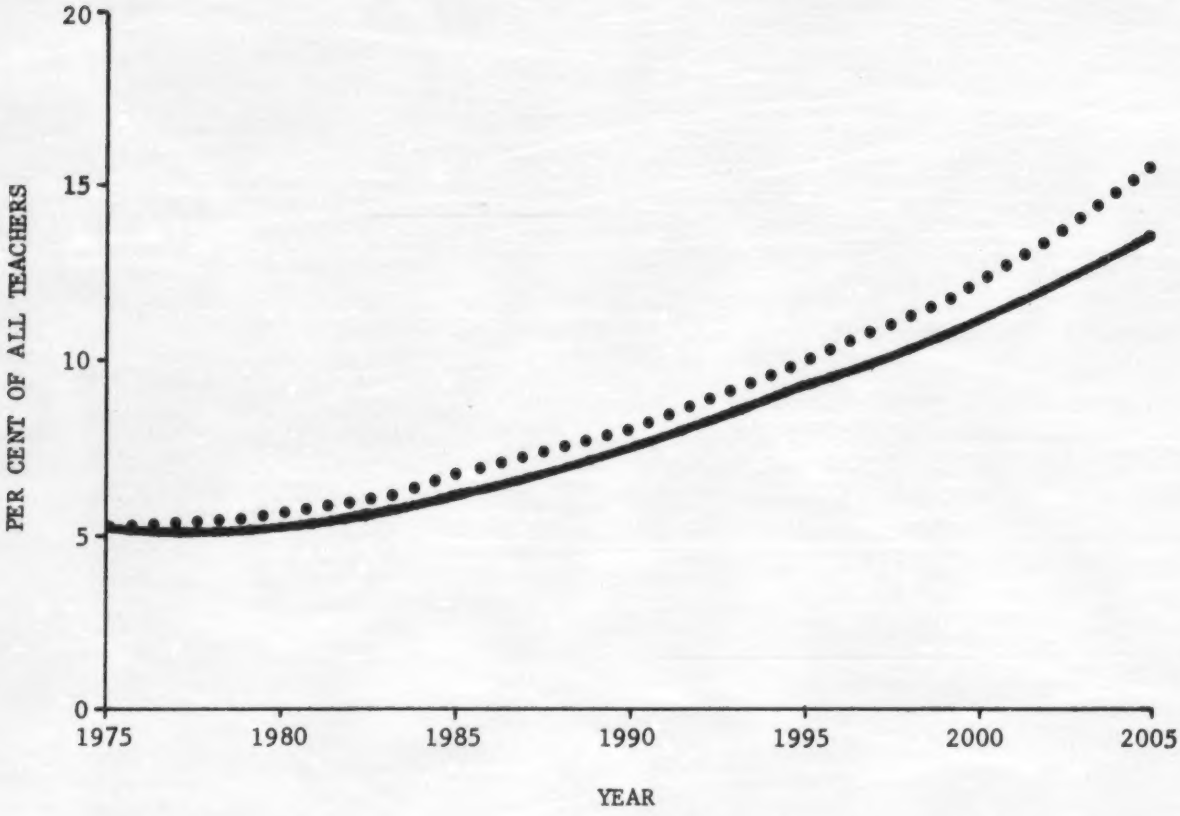
* Under present regulations, teachers are qualified for retirement when they reach 55 provided that the total number of years of service plus their age equals 90 or more.

The process for projecting the aging of teachers is similar to the one used in projecting changes in the length of service of teachers (see previous discussion). The only difference was that here the basic data used was the distribution of teachers by age instead of distribution of teachers by years of experience.

FIGURE 13

PER CENT OF TEACHERS OF AGE 56 AND OVER
ELEMENTARY AND SECONDARY SCHOOLS
ONTARIO, 1975 TO 2005



___ Assumption "A" - Total number of teachers were maintained at the 1975 level

... Assumption "B" - Total number of teachers were adjusted in accordance with the projected enrolment and the 1975 pupil/teacher ratios

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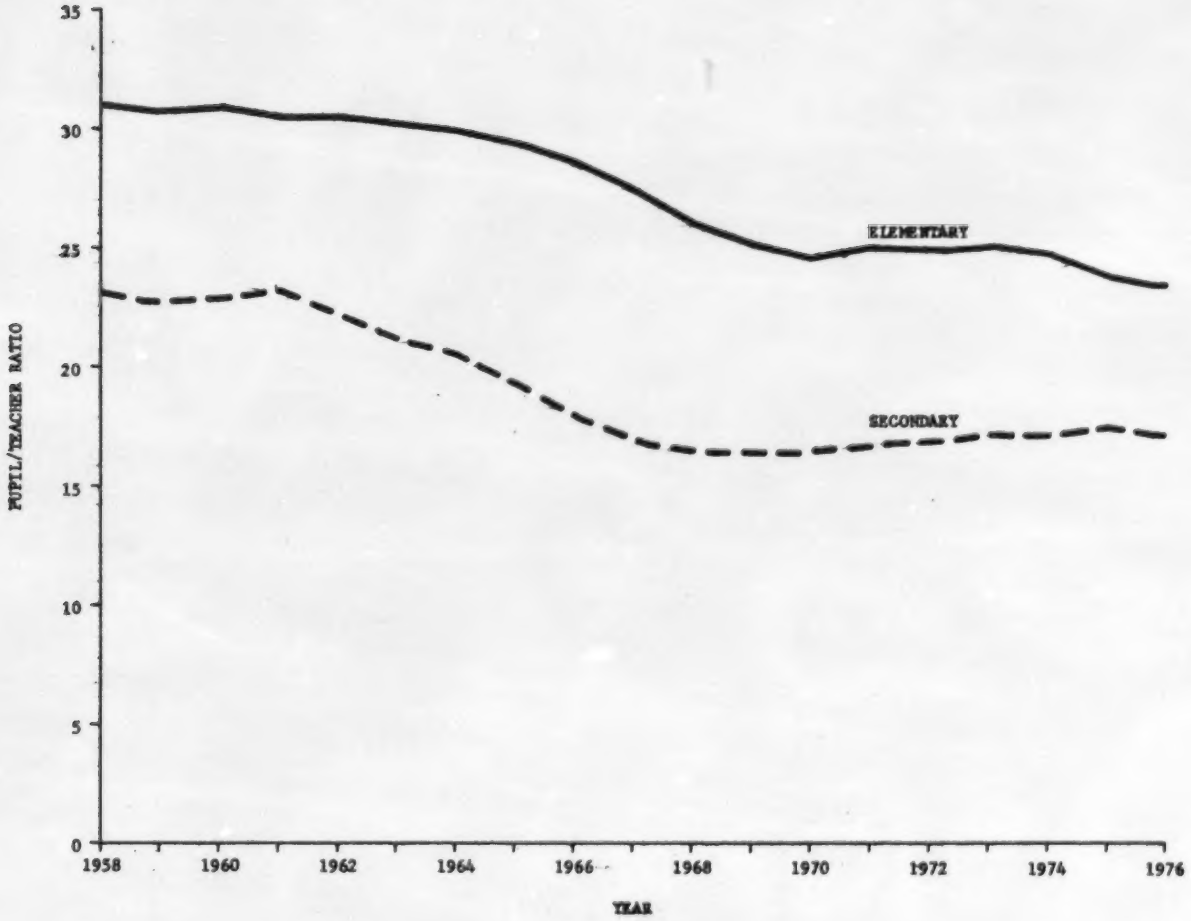
APPENDICES

APPENDIX B

PUPIL/TEACHER RATIOS, ONTARIO, 1958-1976



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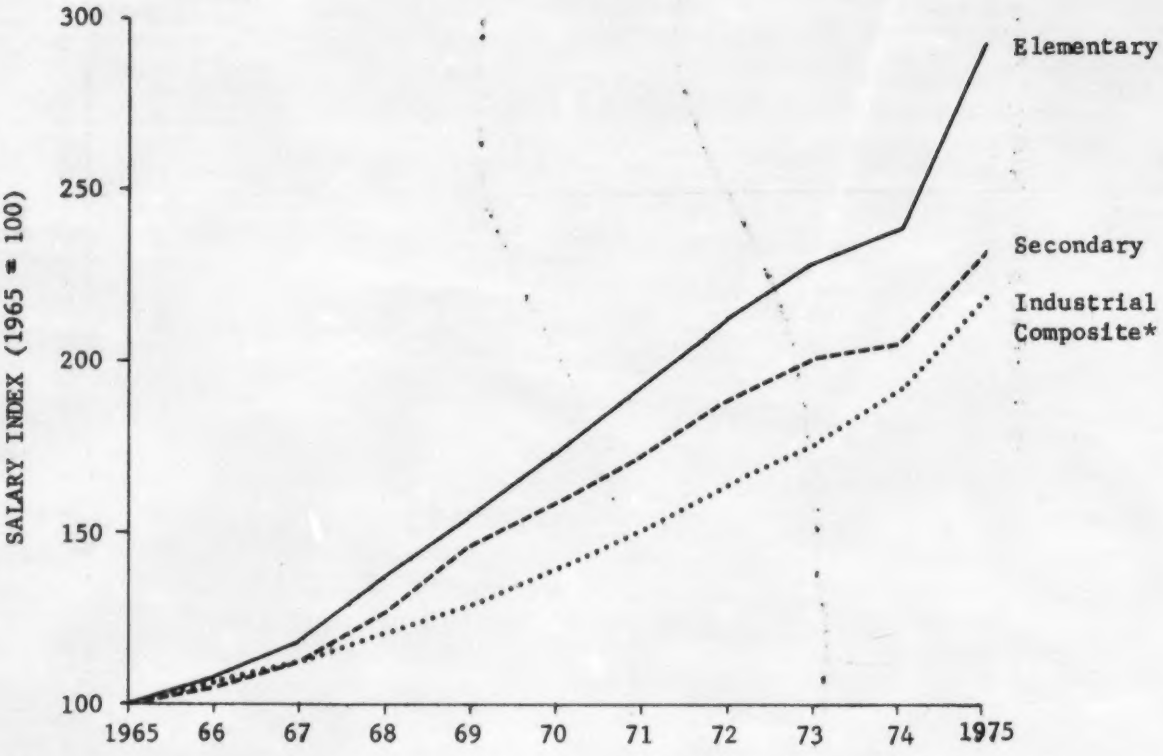
NOTE: The pupil/teacher ratios here are called crude ratios and were computed on the basis of full time teachers.

APPENDIX 2

COMPARISON OF CHANGES IN SALARIES (BASED ON INDEX NUMBER) BETWEEN TEACHERS AND OTHER INDUSTRIES, ONTARIO, 1965-1975



*Industrial composite includes the following groups: forestry, mining, manufacturing, construction, transportation and communication, trade, finance, insurance and service. For details, see Employment, Earnings and Hours, Statistics Canada.

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APPENDIX 3

SUMMARY OF CHANGE IN ENROLMENT, PUPIL PLACES AND SCHOOL BUILDING CONSTRUCTION COST (AT STAGE OF TENDERING), ONTARIO, 1951 TO 1976

ITEMS	NUMBER OR DOLLARS	PERCENTAGE OF TOTAL
Change in the number of pupil places		
Elementary	+1,550,000	72%
Secondary	+592,900	28%
Total	+2,142,900	100%
School construction cost ($'000)		
Elementary	$1,741,400	52%
Secondary	$1,584,700	48%
Total	$3,326,100	100%

Compiled on the basis of data from Education Statistics, Ministry of Education.

Social and Economic Data
Central Statistical Services
Ministry of Treasury, Economics
and Intergovernmental Affairs, 1978